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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,109	12/14/2001	Jakob Nielsen	DSP1	2393

6980 7590 11/18/2005

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EXAMINER	
LAO, LUN S	
ART UNIT	**PAPER NUMBER**
2644	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/023,109	NIELSEN ET AL.	
	Examiner	Art Unit	
	Lun-See Lao	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This action is in response to the amendment filed on 08-29-2005. Claims 1-5 and 7-43 have been amended and claim 6 has been canceled, claims 44-50 have been added. Claims 1-5 and 7-50 have been are pending.

Continued Prosecution Application

2. The request filed on 08-29-2005 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 10/023,109 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Objections

3. Claim 10 is objected to because of the following informalities: claim 10 recites " A method claim according to claim 6" on line11 which appears to be --- A method claim according to claim 1---. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 33-35 and 39-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Consider claims 33-35, the claims are indeterminate in scope because it purports to claim both an apparatus and method of using the apparatus, which are ambiguously

constructed such that claims 33-35 contain an apparatus claim of a listening device, a hearing aid, a headset comprising: a plurality of signal paths for transmitting sound signals to a user, each signal path having a microphone outputs from the signal paths being equalized using the method according to claim 1. Thus, claims 33-35 are failing to particularly point out and distinctly claim the subject matter of the invention.

Consider claims 39-41, the claims are indeterminate in scope because it purports to claim both an apparatus and method of using the apparatus, which are ambiguously constructed such that claims 39-41 contain an apparatus claim of a listening device, a hearing aid, a headset comprising: a plurality of signal paths for transmitting sound signals to a user, each signal path having a microphone; and a signal equalization filter provided for each signal path, wherein the function of the signal equalization filter is determined by the method according to claim 1 and is loaded to the signal equalization filter. Thus, claims 39-41 are failing to particularly point out and distinctly claim the subject matter of the invention.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5, 7-11, 14-24, 26, 28-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner (US PAT. 5,737,433) in view of Hamabe (US PAT. 5,426,703).

Consider claim 16, Gardner teaches that an apparatus for equalizing output signals from a plurality of signals paths, the apparatus comprising:

(b) a module for identifying a transfer function (see fig. 3, (42,44)) of the each signal path based on the corresponding output noise (see col. 2 lines 7-22)

(c) a module (see fig.3, (42,44)) for determining, based on a single selected function (such as, FIR), a filtering function for each signal path such that the product of the transfer function and the filtering function is the selected function (see col. 7 line 1 – col.8 line 35); and

(d) a module (42,43) for applying the filtering function (such as, FIR) for each signal path to the corresponding transfer function, to generate the selected function, such that the output signals from the signal paths are substantially equal with respect to phase or magnitude and phase (see col.7 line 1-col.8 line 35), but Gardner does not clearly teach that each signal path has a microphone, and a module for applying a predictable noise to each signal path to generate an output noise.

However, Hamabe teaches that each signal path has a microphone (see fig.1b 8a-8h), and a module for applying a predictable noise (such as, white noise) to each signal path to generate an output noise (see col. 5 line 31-col.6 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Hamabe into Gardner to provide an

active noise eliminating system which can correct and update the noise elimination transfer function for providing a more reliable noise elimination function without causing noise pressure divergence.

As to claim 1, there is the method claim corresponding to apparatus claim 16. See previous apparatus claim 16 rejection of claim.

Consider claim 43 Gardner teaches that the sound system comprising:

a system for providing sound signals to a user, including:

(a) a plurality of signal paths (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$, for transmitting the sound signals to the user; and

(b) a filter provided to each signal path (see fig.3, (42))

an equalizing module, including:

(d) an identification (42,44) circuit for identifying a transfer function of the each signal path based on the corresponding output noise (see col. 2 lines 7-22) and

(e) a determination circuit (42,44) for determining, based on a single selected (44) function, a filtering function for each signal path (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$ such that the product of the transfer function (42,44) and the filtering function is the selected function (44 and see col. 7 line 1-col. 8 line 35).

when the signal paths (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$ transfer the sound signals to the user, the filtering function being applied to the corresponding filter to generate the selected function (44), whereby the sound signals from the sound providing system are substantially equal with respect to phase or phase and magnitude (see col. 7 line 1-col. 8 line 35), but Gardner does not clearly teach that each signal path includes a

microphone, and a circuit for applying a predictable noise to each signal path to generate an output noise.

However, Hamabe teaches that each signal path includes a microphone (see fig.1b 8a-8h), and a circuit for applying a predictable noise (such as, white noise) to each signal path to generate an output noise (see col. 5 line 31-col.6 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Hamabe into Gardner to provide an active noise eliminating system which can correct and update the noise elimination transfer function for providing a more reliable noise elimination function without causing noise pressure divergence.

As to claim 42, there is the method claim corresponding to system claim 43. See previous apparatus claim 43 rejection of claim.

Consider claims 17-18, Gardner teaches an apparatus of the selected function is the transfer function (see fig.3, (42,44)) for one of the signal paths (see col.7 line 1-col.8 line 35); and an apparatus of the selected function is a common factor (such as, weights), and the filtering function is determined such that the product of the transfer function and the filtering function is the common factor (such as weights and see fig.3, (42,43) and col.7 line 1-col.8 line 35).

As to claims 2-3, these are method claims of claims 17-18 and thus note the rejections of claims 17-18, respectively.

As to claims 44-45, these are system claims of claims 17-18 and thus note the rejections of claims 17-18, respectively.

Consider claim 19 Gardner teaches an apparatus of the module for applying the filtering function comprises:

(a) a filter (see fig.3, 42, 44) provided to each signal path (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$; and

(b) a module (42,44) for loading the filtering function for each signal path (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$ to the corresponding filter (42,44) (see col.7 line 1-col.8 line 35).

Consider claim 20, Hamabe teaches that the module for applying a predictable noise (such as white noise) comprises. for each signal path (see fig.1b):

(a) a noise generator (26) for providing a first predictable noise sample signal (white noise) to the signal path to produce the output noise and providing a second predictable noise sample signal (engine noise), the second predictable noise sample signal(engine noise) having a property corresponding to the first predictable noise sample signal(white noise), the identifying module comprises, each signal path(see fig. 1b):

(b) a module for processing the output noise and the second predictable noise sample signal (engine noise) to identify the transfer function (such as by first and second digital filter) of its corresponding signal path (see col. Col.5 line 32-col. 6 line 67).

As to claims 4-5, these are method claims of claims 19-20 and thus note the rejections of claims 19-20, respectively.

As to claim 46, there is the sound system claim corresponding to apparatus claim 20. See previous apparatus claim 20 rejection of claim.

Consider claims 21-22, Hamabe teaches that the microphone is capable of converting a sound signal to an electrical analog signal and each signal path further includes an analog-to-digital converter coupled to the microphone for converting the electrical analog signal into a digital signal (see fig.1b, (15a-15h); and the microphone is capable of converting a sound signal to an electrical analog signal, and each signal path further includes an analog-to-digital converter coupled to the microphone for converting the electrical analog signal into a digital signal (see fig.1b, (15a-15h); wherein the module for applying a predictable noise (such as, white noise) comprises. for each signal path:

(a) a module for acoustically providing a first predictable noise sample (white noise) to the microphone (8a-8h) inherently with a propagation time delay to produce the output noise ; and

(b) a module for providing a noise signal (such as, error signal) corresponding to the first predictable noise sample (white noise) inherently with the propagation time delay, the module for identifying a filtering function (such as, first and second digital filter and see fig. 1b, (12,13)) comprises for each signal path:

(c) a module for processing the output noise and the noise signal to identify the transfer function(such as, first and second digital filter and see fig. 1b, (12,13)) of its corresponding signal path (see col. 5 line 32-col. 6 line 67).

Consider claim 23, Hamabe teaches that the module for providing a first predictable noise sample (such as, white noise) comprises:

(a) a first noise generator (see fig. 1b (26)) for generating a first predictable digital noise signal (white noise); and

(b) a first converter (15a-15h) for converting the first prediçtable digital noise signal (white noise) into said the first predictable noise sample a the module for providing a noise signal comprises:

(c) a module for providing a second predictable digital noise signal (such as, engine noise) ; and

(d) a second converter (11) for converting the second predictable digital noise signal into the noise signal (see col. 5 line 32-col. 6 line 67).

As to claims 7-8, these are method claims of claims 22-23 and thus note the rejections of claims 22-23, respectively.

Consider claim 24, Hamabe teaches that the second converter comprises:

Synthesizer (see fig.1b (10, controller)) for synthesizing he second predictable digital noise signal (engine noise) with the first predictable digital noise signal (white noise);

(b) a module inherently (because by the controller (CPU)) for delay the second predictable digital noise (engine noise) amount of time as the propagation delay time; and

(c) a module for compensating the second predictable digital noise signal (engine noise) for the conversion factor of the first predictable digital noise signal (white noise and see col. 5 line 32-col. 6 line 67).

As to claim 9, there is the method claim corresponding to system claim 24. See previous apparatus claim 24 rejection of claim.

Consider claim 26, Hamabe teaches that the first converter includes a digital-to-analog converter (17a-17d) for converting the first predictable digital noise signal into an analog noise signal and a loud speaker (7a-7d) for providing the analog noise signal to the microphone (8a-8h and see col. 5 line 32-col. 6 line 67).

Consider claim, 28 Gardner teaches the transfer function (see fig.3, 44, 42) of the signal path is a transfer function of the microphone inherently (because, a microphone connects to a channel for picking up a signal from (see fig.3, $(r_1^{(j)}(n),\ldots r_{mj}^{(j)}(n))$) (see col.2 lines 7-22 and col.7 1-60).

As to claim 10, there is the method claim corresponding to apparatus claim 28. See previous apparatus claim 28 rejection of claim.

Consider claims 29-32, Hamabe teaches that the propagation delay time is selected to be integer multiple (see equation 1) of the first predictable noise sample (white noise and col. 5 line 32-col. 6 line 67); and each of the first predictable noise signal and the second predictable digital noise signal comprises a white noise signal (see fig.1b, 26 and col.5 line 32 - col.6 line 67); and each of the first predictable noise signal (white noise) and the second predictable digital noise signal (engine noise) comprises a random noise signal (col.5 line 32 - col.6 line 67); and the first predictable digital noise signal (white noise) and the second predictable digital noise signal (engine) are generated by the first noise generator (10, and col.5 line 32 - col.6 line 67).

As to claims 11 and 14-15, these are method claims of claims 29 -31 and thus note the rejections of claims 29 -31, respectively.

Consider claims 36-38 Gardner teaches an apparatus is comprising a listening device; and hearing aid (ear covers or cups), and headset (see col.2 lines 7-22) comprising: a plurality of signal paths (see fig.3, 42) for transmitting sound signals to a user, each signal path having a microphone inherently (because, a microphone connects to a channel for picking up a signal from (see fig.3, ($r_1^{(j)}$ (n),...$r_{mj}^{(j)}$ (n))) (see col.2 lines 7-22 and col.7 1-60) outputs from the signal paths being equalized (see fig. 6 and col. 8 line 35-col. 9 line40).

As to claims 33-35, these are method claims of claims 36-38 and thus note the rejections of claims 36-38, respectively.

Consider claims 39-41 Gardner teaches a hearing aid (a listening device and a headset) comprising:

a plurality of signal paths (see fig.3, 42) for transmitting sound signals to a user, each signal path having a microphone inherently (because, a microphone connects to a channel for picking up a signal from (see fig.3, ($r_1^{(j)}$ (n),...$r_{mj}^{(j)}$ (n))) (see col.2 lines 7-22 and col.7 1-60); and a signal equalization filter (see fig.3, (42,44) and col.2 lines 7-22 and col.7 lines 1-60) provided for each signal path, wherein the function of the signal equalization filter is determined by the signal equalization filter(see figs. 6-7 and col. 8 line 35-col. 9 line40).

8. Claims 12-13, 25, 27 and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner (US PAT. 5,737,433) as modified by Hamabe (US PAT.

5,426,703)as applied to claims 1, 16 and 43 above, and further in view of Puckette (US PAT. 3,654,390).

Consider claims 25 and 27, Hamabe teaches that the first noise generator (see fig.1b, (26, white noise)) and the second predictable digital noise signal (engine noise and see col. 5 line 32-col. 6 line 67); but Hamabe does not clearly teach that noise generator is a maximum length sequence generator.

However, Puckette teaches that noise generator is a maximum length sequence generator (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Puckette into the teaching of Hamabe and Gardner to provide synchronizing apparatus using a variable matched filter.

As to claims 12-13, these are method claims of claims 25, 27 and thus note the rejections of claims 25, 27, respectively.

As to claims 47-48, these are sound system claims of claims 25, 27 and thus note the rejections of claims 25, 27, respectively.

9. Claims 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner (US PAT. 5,737,433) as modified by Hamabe (US PAT. 5,426,703) as applied to claims 16 and 43 above, and further in view of Roberts, R. A. et al., "Digital Signal Processing," ISBN 0-201-16350-0, pp. 486-487.

Consider claims 49-50, Gardner teaches that the module for identifying a transfer

function performs (see fig.3, (42,44) and col.2 lines 7-22 and col.7 lines 1-60); Gardner fails to teach that the transfer function performs an Auto Regressive Moving Average (ARMA) to estimate the transfer function.

However, Roberts teaches that the transfer function performs an Auto Regressive Moving Average (ARMA) to estimate the transfer function (see "Digital Signal Processing," ISBN 0-201-16350-0, pp. 486-487).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Roberts into the teaching of Gardner and Hamabe to provide a sound environment for the purpose of acquiring the desired audio sound quality for the market demand.

Response to Arguments

10. Applicant's arguments with respect to claim1-5 and 7-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kellermann (US PAT. 5,602,962) is cited to show other listening device.

12. Any response to this action should be mailed to:

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Commissioner for Patents

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501 The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 11-09-2005

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600